

Note: Section I is compulsory. Attempt any THREE (3) questions from Section II.

(SECTION – I)**2. Write short answers to any EIGHT questions.****(2 x 8 = 16)**

- Why the size of an anion is larger than its neutral atom?
- What is the role of shielding effect on ionization energy?
- Write down electronic configuration of Na and Ca.
- Why the group I-A elements are called alkali metals?
- Give four uses of borax.
- Write down two points about the peculiar behaviour of carbon from its group.
- What happens when borax is heated with NH_4Cl . Write down balanced equation.
- Write down formulas of the following minerals:
(a) Galena (b) Heavy Spar
- Sulphuric acid is a dehydrating agent. Prove it by giving two equations.
- Briefly describe the role of nitrogen in plants.
- Write down the major steps involved in the synthesis of urea fertilizer.
- What are the raw materials used in the manufacture of cement?

3. Write short answers to any EIGHT questions.**(2 x 8 = 16)**

- Prepare Cl_2O_7 with the help of chemical reaction.
- Prepare HClO_4 . Also write down its two properties.
- Write down any four uses of bleaching powder.
- Write down the name of any four methods for prevention of corrosion.
- How Zinc coating or anode coating prevents the iron from corrosion?
- Describe the x-rays structure of benzene.
- Prepare benzene and toluene from alkane with equation.
- Write down the reaction of acetone with 2, 4 - dinitrophenylhydrazine.
- Write down any four uses of acetaldehyde.
- How acetic acid is prepared from acetylene?
- Write down the chemical reaction of CH_3COOH with (i) $\text{C}_2\text{H}_5\text{OH}$ (ii) NH_3
- How would you convert acetic acid into acetic anhydride?

4. Write short answers to any SIX questions.**(2 x 6 = 12)**

- Define geometric isomerism giving one example.
- What are aliphatic compounds? Give their two examples.
- What is clemmensen reduction? Give example.
- Convert (a) Methane into ethane (b) Ethene into ethylene glycol.
- State Markownikov's Rule with an example.
- Define nucleophile and substrate. Giving one example in each case.
- Convert ethyl chloride into (a) Ethane (b) Tetraethyl Lead
- What is denaturing of alcohol?
- How will you distinguish between ethanol and methanol by a chemical test?

(SECTION - II)

- (a) Define electron affinity. How does it vary in groups and periods generally in the periodic table. 4
(b) Give the formula of Sylvite, Borax, Trona, Natron, Dolomite, Alunite, Asbestos and Barite. 4
- (a) Discuss the preparation of nitric acid by Birkeland and Eyde's process. 4
(b) Discuss the binding energies and oxidation states of transition elements. 4
- (a) Write down note on reforming of gasoline. 4
(b) Explain oxidation of aldehydes and ketones with two examples in each case. 4
- (a) How alkanes can be prepared by Kolbe's electrolytic method. Write down its mechanism. 4
(b) What is β -Elimination reaction? Differentiate between E_1 and E_2 elimination reactions. 4
- (a) Describe Kekule's structure of benzene. 4
(b) How does ethanol react with
i) Na ii) PCl_5 iii) CH_3MgI iv) SOCl_2

Roll No. of Candidate : _____
CHEMISTRY (INTERMEDIATE PART-II) 421 - (I) Paper II (Group – II)

Time: 20 Minutes

OBJECTIVE Code: 8482

Marks: 17

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank.

1. Keeping in view the size of atoms, which order is the correct one
(A) $Mg > Sr$ (B) $Ba > Mg$ (C) $Lu > Ce$ (D) $Cl > I$
2. Which ion will have the maximum value of heat of hydration
(A) Na^+ (B) Cs^+ (C) Ba^{2+} (D) Mg^{2+}
3. Which element forms an ion with charge +3
(A) Be (B) Al (C) C (D) Si
4. Laughing gas is chemically
(A) NO (B) N_2O (C) NO_2 (D) N_2O_4
5. Hydrogen bond is strongest between the molecules of
(A) HF (B) HCl (C) HBr (D) HI
6. Which halogen occurs naturally in a positive oxidation state?
(A) fluorine (B) chlorine (C) bromine (D) iodine
7. The strength of binding energy of transition elements depends upon:
(A) number of electron pairs (B) number of unpaired electrons
(C) number of neutrons (D) number of protons
8. Select from the following the one which is alcohol
(A) $CH_3 - CH_2 - OH$ (B) $CH_3 - O - CH_3$ (C) CH_3COOH (D) $CH_3 - CH_2 - Br$
9. Preparation of vegetable ghee involves
(A) halogenation (B) hydrogenation (C) hydroxylation (D) dehydrogenation
10. Which of the following acid can be used as a catalyst in Friedel-Crafts reactions?
(A) $AlCl_3$ (B) HNO_3 (C) $BeCl_2$ (D) NaCl
11. Which one of the following is not a nucleophile?
(A) H_2O (B) H_2S (C) BF_3 (D) NH_3
12. Which compound shows hydrogen bonding?
(A) C_2H_6 (B) C_2H_5Cl (C) $CH_3 - O - CH_3$ (D) C_2H_5OH
13. Cannizzaro's reaction is not given by
(A) formaldehyde (B) acetaldehyde (C) benzaldehyde (D) trimethylacetaldehyde
14. Which of the following will have the highest boiling point?
(A) methanol (B) ethanal (C) propanal (D) 2-hexanone
15. Acetic acid is manufactured by
(A) distillation (B) fermentation (C) ozonolysis (D) esterification
16. Which acid is used in the manufacture of synthetic fibre?
(A) formic acid (B) oxalic acid (C) carbonic acid (D) acetic acid
17. Ammonium nitrate fertilizer is not used for which crop?
(A) cotton (B) wheat (C) sugar cane (D) paddy rice

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Note: Section I is compulsory. Attempt any THREE (3) questions from Section II.

(SECTION – I)**2. Write short answers to any EIGHT questions.****(2 x 8 = 16)**

- Explain the variation in melting points along the short periods.
- Why the ionic radii of negative ions are larger than the size of their parent atoms?
- Why the elements of group IIA are called alkaline earth metals?
- Write down major problems faced during the preparation of sodium hydroxide by the diaphragm cell.
- Write down the four uses of borax.
- Give the chemistry of borax bead test.
- How will you convert boric acid into borax and vice versa?
- Describe "ring test" for the confirmation of nitrate ions in solution.
- What is "aqua regia"? How does it dissolve gold?
- What are essential nutrient elements? Why these are needed for plant growth?
- Write down the important raw materials used for the manufacture of cement.
- What do you mean by prilling of urea?

3. Write short answers to any EIGHT questions.**(2 x 8 = 16)**

- Convert acetic acid into ethane by reduction method.
- Give the mechanism for ester formation.
- How acetic acid is prepared from Grignard's Reagent? Give reaction.
- How will you distinguish between ethanal and propanal?
- Convert methanol into ethanal?
- Convert ethyl benzene into benzoic acid.
- What is wurtz-fitting reaction? How it helps to prepare ethyl benzene?
- Why does damaged tin plated iron get rusted quickly?
- Mention any four properties of transition elements.
- Give uses of bleaching powder.
- What are oxyacids of chlorine? Give their names and formulas.
- How does chlorine react with $\text{NaOH}_{(\text{aq})}$ at different temperatures?

4. Write short answers to any SIX questions.**(2 x 6 = 12)**

- Define functional group? Give examples of oxygen containing functional groups.
- How quality of fuel can be improved?
- What is ozonolysis? Write down chemical equation.
- How does propyne react with the following reagents:
(a) $\text{AgNO}_3 / \text{NH}_4\text{OH}$ (b) $\text{Cu}_4\text{Cl}_2 / \text{NH}_4\text{OH}$
- What is β -Elimination reaction?
- What is nucleophile? Give two examples of nucleophiles.
- How methanol and ethanol can be distinguished?
- Write down two reactions of alcohol in which O-H bond is broken.
- What is mustard gas? How it can be prepared?

(SECTION - II)

- Write down note on ionization energy. Give its variation within groups and periods. 4
 - Explain peculiar behaviour of beryllium among its group members. 4
- Write down four similarities and four differences between oxygen and sulphur. 4
 - Discuss the following properties of transition metals: 4
 - Para magnetism
 - Oxidation State
- Define hybridization. Explain SP^2 hybridization with one example. 4
 - Write down any eight uses of formaldehyde. 4
- How will you convert ethyne into
 - Acetaldehyde
 - Divinyl Acetylene
 - Chloroprene
 - Glyoxal
 4
 - What is cannizzaro's reaction? Give an example and mechanism. 4
- Predict the major products of bromination of the following: 4
 - Toluene
 - Nitrobenzene
 - Benzaldehyde
 - Benzoic acid
 - How methanol is prepared on industrial scale? Why is it also called wood spirit? 4